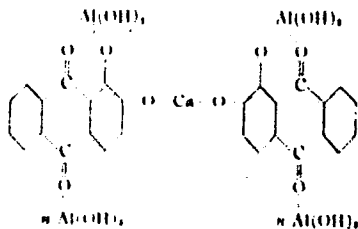


Water-soluble nigrosine. A. A. Krasnovskii. Russ.
52,468, Jan. 31, 1938. Aniline is heated with $C_6H_5NO_2$
in the presence of $FeCl_3$ and the product is sulfonated.

CA

Mechanism of the formation of aluminum-calcium alizarin lake A. A. Krasnovskii, *Org. Chem. Ind.* (U. S. S. R.) 5, 507 (1964). A review of the literature and preliminary exptl. evidence show that in the 1st phase of the reaction of alizarin with CaCl_2 and $\text{Al}(\text{OH})_3$, the Ca ions and alizarin are adsorbed on the surface of $\text{Al}(\text{OH})_3$. The disson. of the adsorbed alizarin forms a colored alizarate anion. On prolonged heating the complex components combine to give the chem. compd. I:



(I)

(A light fast lake was obtained with $n = 1$). The structure of I is shown by the theoretical proportion of the chemically combined Ca , independent of the conditions of prepn., its definite fastness to light and the sp. x-ray crystal pattern, different from that of the traction components and Ca and Al alizarates. The identical results obtained with alizarin and Na alizarate are an added proof of the chem. and not the adsorptive character of the lake. I is formed by the Werner coordinated intracomplex linkage of the 2 α -OH with O of the 2 CO in the 9-position, the chem. interaction of the β -OH in 2 mols. alizarin with Ca to give a salt and the satn. of the residual valencies of O in the 2 CO groups in the 10-positions by adsorption of excess $\text{Al}(\text{OH})_3$. The difference in the color tones of the madder lake, obtained under various conditions and concns., depends not on the chem. compn. but on its dispersion and, probably, also on the quantity of retained water of hydration. The work is being continued. 30 references. Chas. Blane

ASR, S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

FROM: 11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

11/1/64

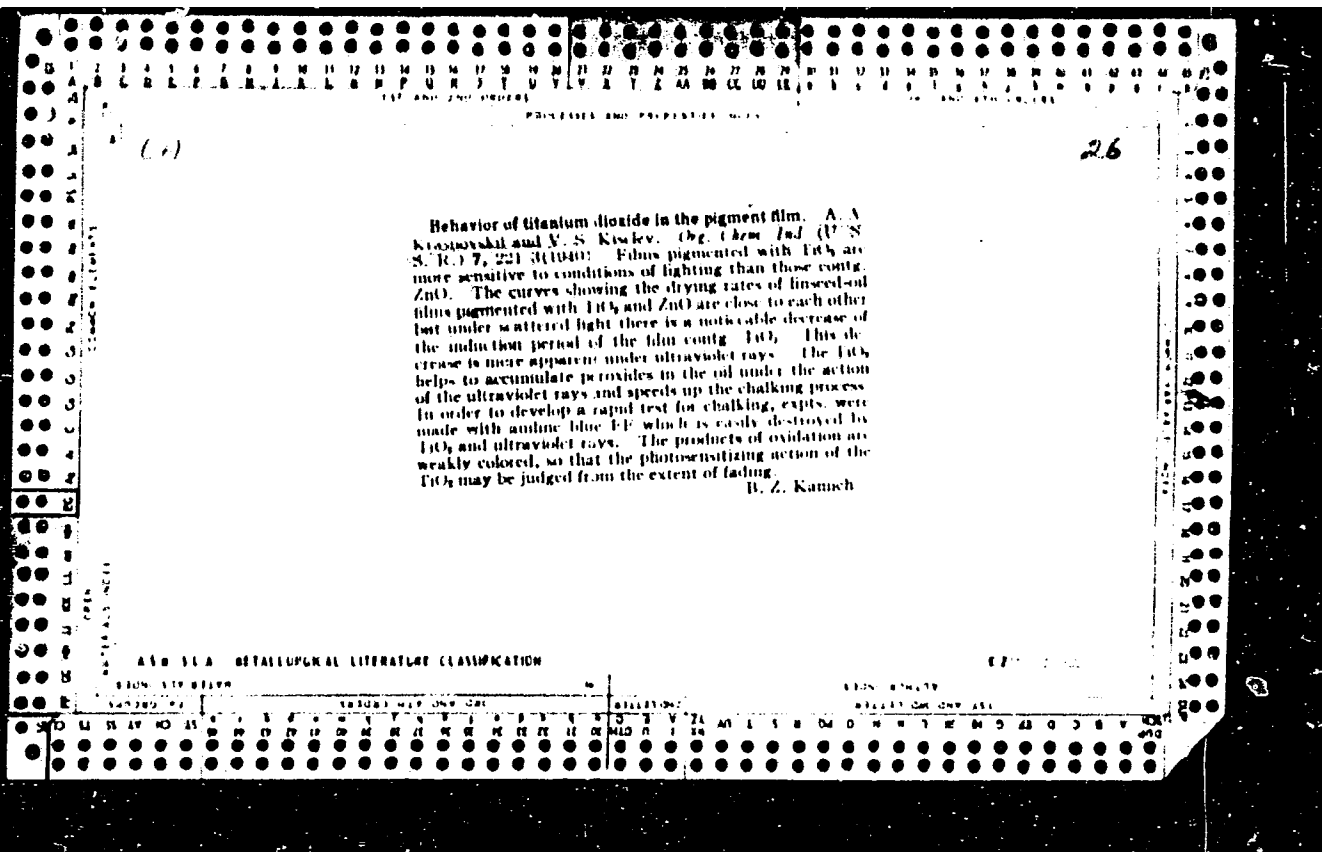
11/1/64

11/1/64

11/1/64

11/1/64

11/1/64



117 AND 120 ORDERS

PROCESSING AND PROPERTY INDEX

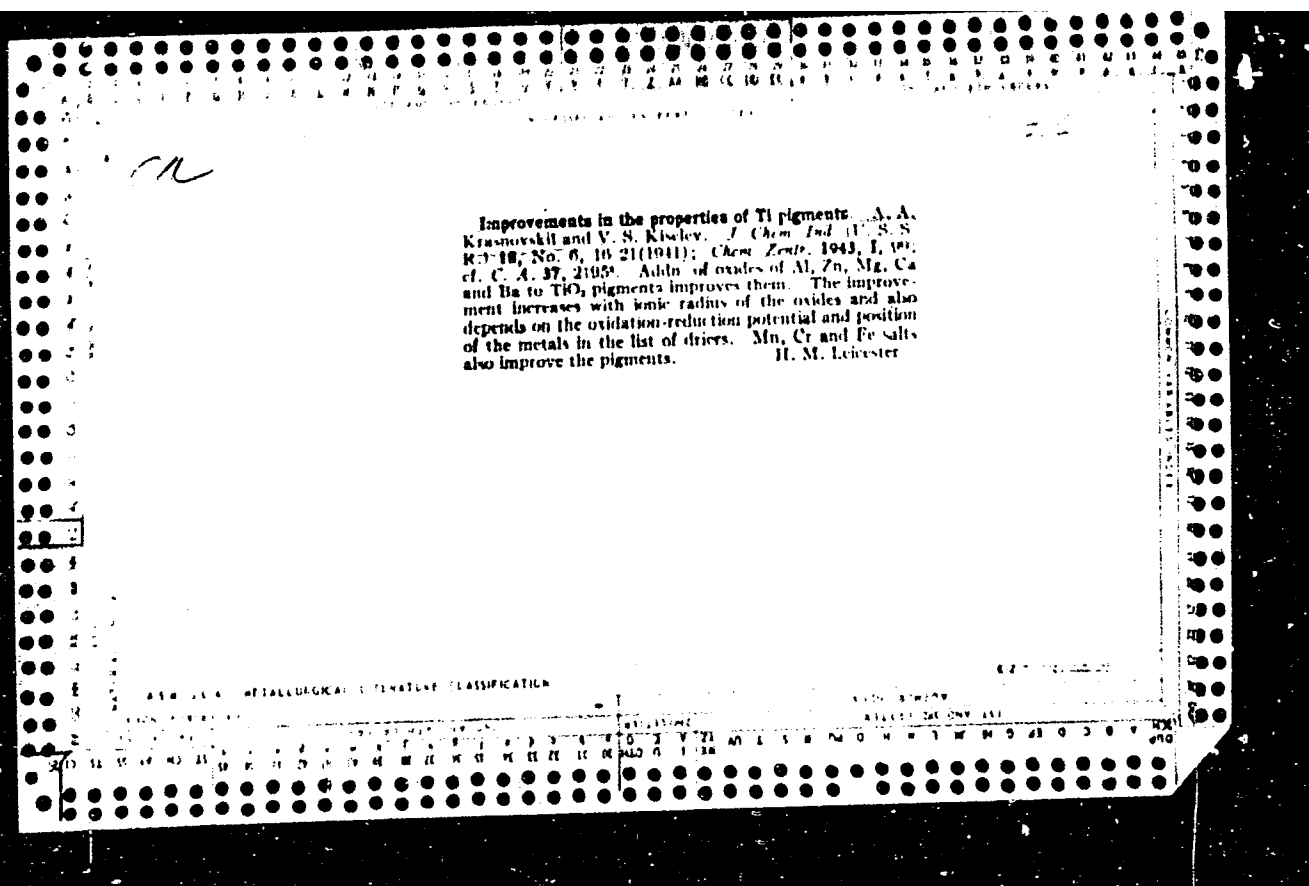
3

C-9

The photochemical oxidation of aromatic hydrocarbons
 A. A. Krasnovskii *J. Gen. Chem.* (U. S. S. R.) 10, 1091
 (1939) Peroxides can be detected volumetrically in
 hydrocarbons by their oxidation of bivalent Fe in the pres-
 ence of NH_4NS . Me_2CO is used as the solvent. Oxida-
 tion of MePh and the xylene occurs in 2 steps. If a const-
 stream of air is supplied, the effective order of the reaction
 of peroxide formation is zero, and of peroxide decomposi-
 to the acid is 1. The rate constants of these reactions are:
 for MePh , $K_1 = 4.82$, $K_2 = 0.70$; for $o\text{-Me}_2\text{C}_6\text{H}_4$, $K_1 =$
 7.06, $K_2 = 2.22$; for $m\text{-Me}_2\text{C}_6\text{H}_4$, $K_1 = 3.45$, $K_2 = 0.88$;
 for $p\text{-Me}_2\text{C}_6\text{H}_4$, $K_1 = 0.20$, $K_2 = 1.00$. The hydrocarbons
 absorb a quantum and tautomerize to the quinoid form
 which adds O_2 and the addn. compd. rearranges to the
 stable peroxide.
 H. M. Leicester

Chem & Lacquer and Paint Technology
 Moscow Chem-Tech. Inst. im. Mendeleev

ASB-51.6 METALLURGICAL LITERATURE CLASSIFICATION



[illegible]

KRASN'YKH, A. A. (Moscow)

"Modern Concepts of Photosynthesis" (p.159) by Krasn'yy, A. A.

SO: Advances in Modern Biology (Uspekhi Sovremennoi Biologii) Vol XXI, No. 2, 1976

CA

11 A

Catalytic and photosensitized oxidation of ascorbic acid by phthalocyanines. A. A. Krasnovskii and G. P. Brin. *Compt. rend. acad. sci. U.R.S.S.* 53:443-6(1960)(in English). — The catalytic action of phthalocyanine (I) and its Mg (II) and Cu (III) complexes on the oxidation of aq. solus. of ascorbic acid (IV) was compared with that of CuO (V) and CuSO₄ (VI). A kinetic study was made by the manometric technique of Warburg and Barcroft. H₂O₂ generation is so slight that it does not affect the activity of the catalysts. Reactions were carried out both in darkness and in the light of a 200-w. incandescent lamp placed about 5 cm. from the bottom of the flat container. Reactions were carried out at 20, 30, and 40° (±0.05°). The container was oscillated 90-110 times/min. through an arc amplitude of 7 cm. Into the side arm of the container was introduced 0.75 ml. 1% IV (purity 99%). and into the middle portion 3 ml. thrice-distd. H₂O and 30 mg. powd. catalyst. In the tests with VI, the concn. was 10⁻⁴ mole/l. I, II, and III were prepd. by Linstead's method (C.I. 28, 61429). K. and B. give the graphs obtained of O absorbed vs. time in the case of III (in the dark and in the light) and in controls with IV in absence of catalyst. Data are given for all other catalysts as well. Reactions carried out in the dark conformed satisfactorily to the Arrhenius equation except when III was used. In this case, in the interval 20-30°, the temp. coeff. was 1.07; within the interval 30-40°, it was 1.1,

indicating diffusion kinetics in this last interval, which appear to be in harmony with the hydrophobic properties of III. The effective energy of activation cannot be used generally as a criterion of activity, but it was noted that the lowest values were observed with III and VI. Solns. of IV in H₂O alone were found to be relatively stable, although the oxidation is accelerated slightly by light, despite the fact that IV does not absorb within the visible spectrum. The reaction may be catalyzed by dust particles. The value of the energy of activation is of the same order as for the reaction in the presence of V. With the exception of VI, illumination greatly accelerated the process. In the presence of light, catalytic and photosensitized effects are superimposed on one another. II and III were the most active photochemically. Except in the case of III, the reaction in light obeys the Arrhenius equation. With III, the rapid photoprocess is probably limited by a secondary chem. reaction, the value of the effective energy of activation in this case being lower than that when the reaction was carried out in darkness. The effective energies of activation of the photochem. process were calcd. by subtracting the rate const. in the dark from that obtained in the light. The mechanism of the oxidation of IV in the presence of Cu²⁺ is discussed briefly, the production of Cu⁺ in the course of the catalysis of IV having been demonstrated by magnetometric measurements (cf. Tyson and Wiley, C.A. 39, 5819). 12 recent references are given.

Louis B. Wise

ASH S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND COVERS		PROCESSES AND PROPERTIES INDEX		1ST AND 2ND INDEXES	
<p>Photochemistry of photosynthesis. A. A. Krasnovskii. <i>Bull. acad. sci. U.R.S.S., Ser. biol.</i> 1947, 377-383 (in Russian). Review. G. M. Kosolapoff</p>					
<p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>					
<p>1947</p>		<p>1948</p>		<p>1949</p>	
<p>1950</p>		<p>1951</p>		<p>1952</p>	
<p>1953</p>		<p>1954</p>		<p>1955</p>	
<p>1956</p>		<p>1957</p>		<p>1958</p>	
<p>1959</p>		<p>1960</p>		<p>1961</p>	
<p>1962</p>		<p>1963</p>		<p>1964</p>	
<p>1965</p>		<p>1966</p>		<p>1967</p>	
<p>1968</p>		<p>1969</p>		<p>1970</p>	
<p>1971</p>		<p>1972</p>		<p>1973</p>	
<p>1974</p>		<p>1975</p>		<p>1976</p>	
<p>1977</p>		<p>1978</p>		<p>1979</p>	
<p>1980</p>		<p>1981</p>		<p>1982</p>	
<p>1983</p>		<p>1984</p>		<p>1985</p>	
<p>1986</p>		<p>1987</p>		<p>1988</p>	
<p>1989</p>		<p>1990</p>		<p>1991</p>	
<p>1992</p>		<p>1993</p>		<p>1994</p>	
<p>1995</p>		<p>1996</p>		<p>1997</p>	
<p>1998</p>		<p>1999</p>		<p>2000</p>	

CA

3

Absorption spectra of magnesium phthalocyanine. V. B. Evstigneev and A. A. Krasnovskii (A.N. Bakh Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 58, 417-20 (1947).—Mg phthalocyanine crystd. from pyridine retains $2H_2O$ and free phthalocyanine which cannot be removed even by sublimation *in vacuo*. The free phthalocyanine can be removed by agitation with Me_2CO until intense color appears and the soln. on evapn. gives a pure Mg deriv. The following max. were obtained: in Me_2CO 605, 638, 601, 344 nm; in $EtOH$ 608, 640, 605, 341, 283; in Et_2O 600, 638, 601, 244; in pyridine 673, 647, 608, 340; in dioxane 606, 638, 602, 344; in $C_{12}H_{10}$ 672, 646, 608, 340; in $MePh$ 672, 646, 600, 346; in 1,2,4-tetrahydronaphthalene 672, 646, 600, 347; in 1- $BrC_{10}H_7$ 678, 649, 613, 355; in solid film 630, 335, 290. The spectra resemble those of chlorophyll in band positions and intensities. G. M. Kosolapoff

CA

3

Photochemical oxidation of magnesium phthalocyanine and chlorophyll. A. A. Krasnovskii (A. N. Bakh Institute, Moscow). *Doklady Akad. Nauk S.S.S.R.* 58, 111, 29 (1947); cf. *C.A.* 43, 44. Solns. of Mg phthalocyanine (I) or chlorophyll (a + b) (II) in 95% EtOH were oxidized with atm. O₂ with a red filter (Schott RG-2) used for illumination. Photooxidation of I yields colorless products and in 18 min. the extinction coeff. of I at 665 mμ drops from 0.96 to 0.04; for II the change is from 0.96 to 0.195. Boiling the soln. of oxidation products of I leads to partial regeneration of the starting material, while ascorbic acid aids the reverse process at room temp. giving some 6-8% regeneration at 24-30% concn. of ascorbic acid in soln. KCl also aids regeneration. Long irradiation leads to irreversible oxidation, however. Photooxidation of II gives yellow products (abs. max. 500-600 mμ), which are reduced by ascorbic acid in the cold or on heating; KCl has no effect. However the process does not yield II since the abs. max. at 665 mμ is not increased; not over 10% oxidized II is reduced. Thus, photooxidation goes at the expense of reactions of long-lived excited state with dissolved O₂; the excited state does not seem to be merely a tautomeric form, but may be a biradical. The primary labile product on heating is changed to a more stable substance with destruction of conjugated-band system. The labile products from I are more reactive than those from II, since even oleic acid is capable of slow reaction with them. G. M. Kosolapoff

CA 10

Reversibility of chlorophyll oxidation and magnesium phthalocyanine by benzoyl peroxide. A. A. Krasnovskii (A. N. Bakh Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 58, 825-7 (1947).—While H_2O_2 in $EtOH$ does not oxidize the 2 pigments at 10^{-4} M concn., Br_2O_3 reacts and the reaction can be followed spectrometrically. The oxidized products can be partially reduced by ascorbic acid or $PhNHNH_2$; $(CO_2H)_2$, $(CH_3CO)_2S$, $AcCO_2H$, and oleic acid are inactive. Specimens that were heated or allowed to react for a long time lost their ability to be reduced. The results are given graphically. Spectral properties of the products of dark or photochem. oxidation are quite similar; Mg phthalocyanine gives colorless products while chlorophyll (a + b) shows absorption maxima at 600-600 mμ. Oxidation with Br_2O_3 produces oxidation products which are more labile than those produced by photochem. oxidation, and can be reduced by ascorbic acid. G. M. Kosolapoff

CA

110

Photosensitizing action of magnesium phthalocyanine and chlorophyll in solution. A. A. Krasnovskii and G. P. Brin (A. N. Bakh Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 58, 1087, 908 (1947); cf. C.A. 43, 114. Oxidation of oleic acid and oxidation of ascorbic acid were examined as to sensitization by Mg phthalocyanine or chlorophyll. In both cases the results were pos. (given graphically). The mechanism appears to be that of resonant donation of the electron spin in the sensitizers, putting them into excited state; the products combine with O and O is then transferred to the O-acceptors. In the case of oleic acid the process appears to continue as a chain reaction. No temp. dependence was found, indicating that the photochem. stage is the rate-detg. step. Chlorophyll, having labile H, in contrast to the phthalocyanine deriv., possesses stronger sensitizing activity. The photooxidation of the sensitizer decreases in the presence of the O-acceptors used; with phthalocyanine there is more destruction of the pigment during the reaction when oleic acid is present than is observed in its absence.

G. M. Kozlovskii

CA

3

Absorption spectra of the phthalocyanines. V. B. Evstigneev and A. A. Krasnovskii (A. N. Bakh Biochem. Inst., Moscow). *Doklady Akad. Nauk S.S.S.R.* 58, 1398-1402 (1947).—The following abs. max. were found: metal-free phthalocyanine: in dioxane 688 (ε 1.5), 655 (1.4), 630 (0.40), 620 (0.41), 595 (0.20), 314 (0.78), in 95% H₂SO₄ 838 (1.14), 773 (0.83), 745 (0.63), 680 (0.23), 440 (0.21), 305 (0.55). Cu phthalocyanine in dioxane: 670 (2.8), 648 (1.4), 615 (0.4), 605 (0.43), 430 (0.14), 375 (1.0), 347 (0.86); in H₂SO₄ 791 (2.02), 748 (0.41), 698 (0.35), 440 (0.27), 305 (0.57). Sulfonated Cu phthalocyanine in dioxane was not run, but in MeOH it gave 670 (1.22), 603 (0.27), 343 (0.53), in H₂SO₄ 775 (1.63), 688 (0.22), 425 (0.14), 305 (0.43), and in water 628 (0.3), 335 (0.26) and 265 (0.2).

While the Cu deriv. is quite stable in concd. H₂SO₄, the metal-free phthalocyanine (pptd. by treatment of a Mg deriv. with concd. H₂SO₄ and diln. with water, followed by careful washing of the ppt. & decomp. at the rate of 3-4° per hr. The spectra suggest that the proton adds to phthalocyanine on N atoms that are part of the 18-membered conjugated system rather than on N atoms of the pyrrole rings. Abs. max. of chlorophyll (a + b) in Et₂O are at 680 and 420 mμ, while in H₂SO₄ the first max. declines by 50% in intensity and shifts slightly toward 680, and the 2nd max. declines but slightly and shows a slight shift toward 400 mμ. G. M. Kosolapov

KRASNOVSKIY, A. A.

PA-77T9

USSR/Chemistry - Chlorophyll, Restoration Apr 1948
Chemistry - Ascorbic Acid

"Reversible Photochemical Restoration of Chlorophyll
by Ascorbic Acid," A. A. Krasnovskiy, Inst Biochem
imeni A. N. Bakh, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LX, No 3

Studies possibility of photochemical restoration of
chlorophyll and magnesium dicyanide found in green
cells in compounds with ascorbic acid, citric,
racemic and ethyl esters, phenylhydrazine, and hydro-
quinine. Submitted by Acad A. N. Terenin 19 Feb 1948

77T9

KRASNOVSKIY, A. A.

USSR/Chemistry - Chlorophylls, Fluorescence May 1948

Chemistry - Phthalocyanine, Magnesium Derivatives

"The Attenuation of the Fluorescence of Magnesium Phthalocyanine and Chlorophyll by Foreign Molecules," V. B. Yevstigneyev and A. A. Krasnovskiy, Inst Biochem imeni A. N. Bakh, Acad Sci USSR, 4 pp

"Dokl Ak Nauk SSSR" Vol 14, No 4

Description and results of subject experiments. Fluorescence attenuations of magnesium phthalocyanine and chlorophyll are similar, which proves that effect is not connected with labile hydrogen atoms in chlorophyll molecule and shows resemblance between tetraporphin and porphyrin systems of conjugate double bonds. Molecule oxidizers with electron affinity (quinone, oxygen) greatly attenuate fluorescence of pigments investigated while reducers (hydroquinone, ascorbic acid, NaI and KI) are far less active. Submitted 12 Feb 1948.

7776

KRASNOVSKIY, A. A.

PA 8/49TS

USSR/Chemistry - Photography
Chemistry - Photochemistry

Jul 48

"Oxidation Reduction Reactions Photosensitized by Chlorophyll and Magnesium Phthalocyanine, Which Occur Due to an Increase in the Free Energy of the System," A. A. Krasnovskiy, Inst of Biochem Imenl A. N. Bekh, Acad Sci USSR, 3 1/2 pp

"Dok Ak Nauk SSSR" Vol LVI, No 1

From series of experiments, Krasnovskiy discovered the possibility of a reversible photochemical reduction by ascorbic and pyrazacemic acid of a number of dyes, the most interesting being riboflavin and safranin T. (Ascorbic acid, 8/49TS

USSR/Chemistry - Photography (Contd)

Jul 48

for which $E_0 = +0.05$ V at pH = 7, cannot reduce riboflavin ($E_0 = -0.22$ V) and safranin T ($E_0 = -0.29$ V) in darkness). Describes experiments in detail. Tabulates and plots results. Submitted 22 Apr 1948.

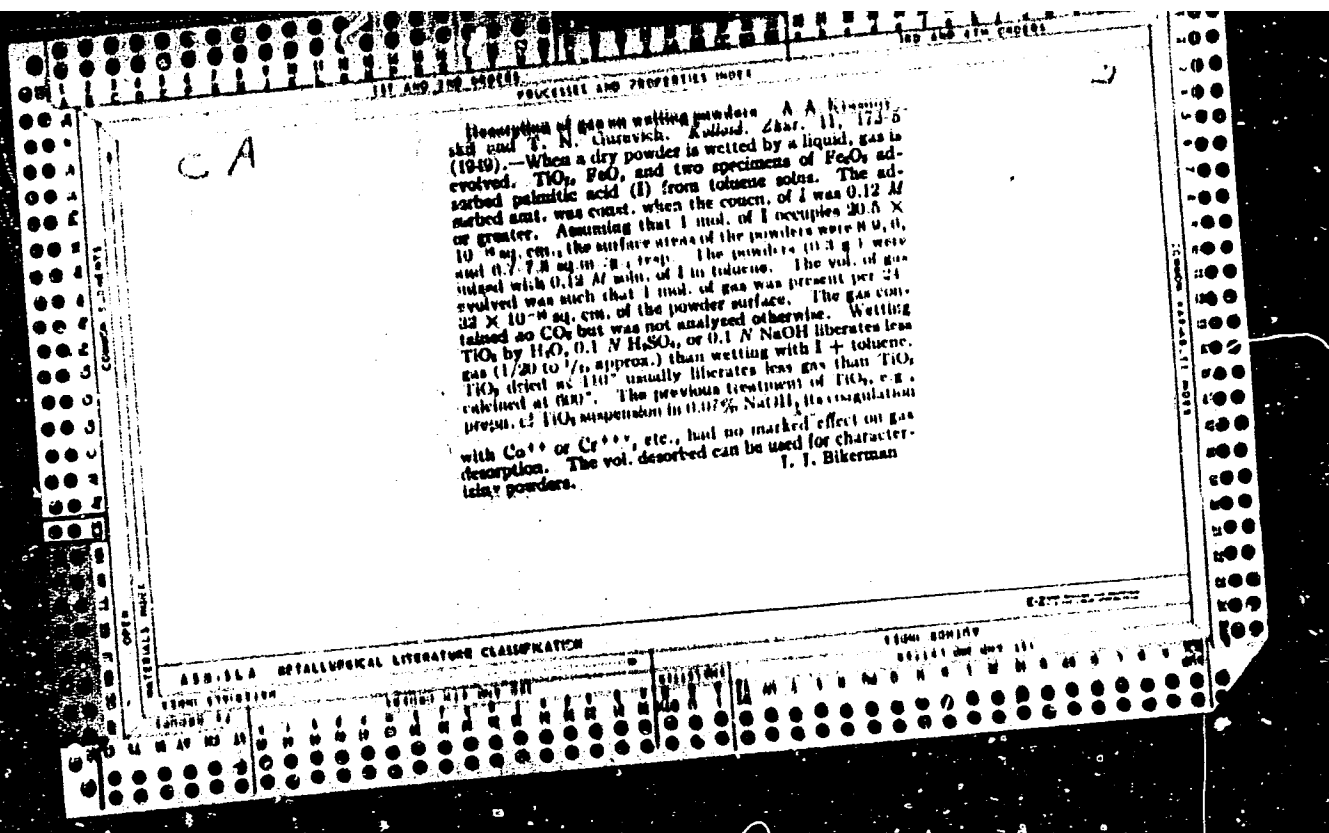
8/49TS

3

CA

Optical and photochemical properties of chlorophyll in different forms of combination. A. A. Krasnovskii and G. P. Brin. *Doklady Akad. Nauk S.S.S.R.* 63, 163-5 (1948).—The photochem. activity of chlorophyll preps., as indicated by activation of reversible oxidation of ascorbic acid, varies with their fluorescence. Max. absorption of red light is at 677-678 and at 668-670 mμ in living leaves, and at 670-680 mμ for nonfluorescent chlorophyll exs. The following preps. of chlorophyll exhibited both fluorescence and photochem. activity: solns. in org. solvents, fatty acids, fats, and lecithin, and aq. emulsions thereof, solns. in aq. ethanol-detergent mixts., aq. colloidal solns. of chloro-

phyll-protein (zein, gliadin, casein, fibroin, wool keratin, ovalbumin) complexes, and chloroplasts and granules in aq. detergent solns.
B. A.



KRASNOVSKIY, A. A.

A. N. Terenin and A. A. Krasnovskiy

"The Problem of Migration of Energy in Biological Processes" appeared in the Soviet journal "The Results of the Physical Sciences," 1949, volume No. 27, No. 1.

Full translation available.

XXV-1

KRASNOVSKIY, A. A.

PA 46/49T11

USSR/Chemistry - Chlorophyll
Chemistry - Photochemistry

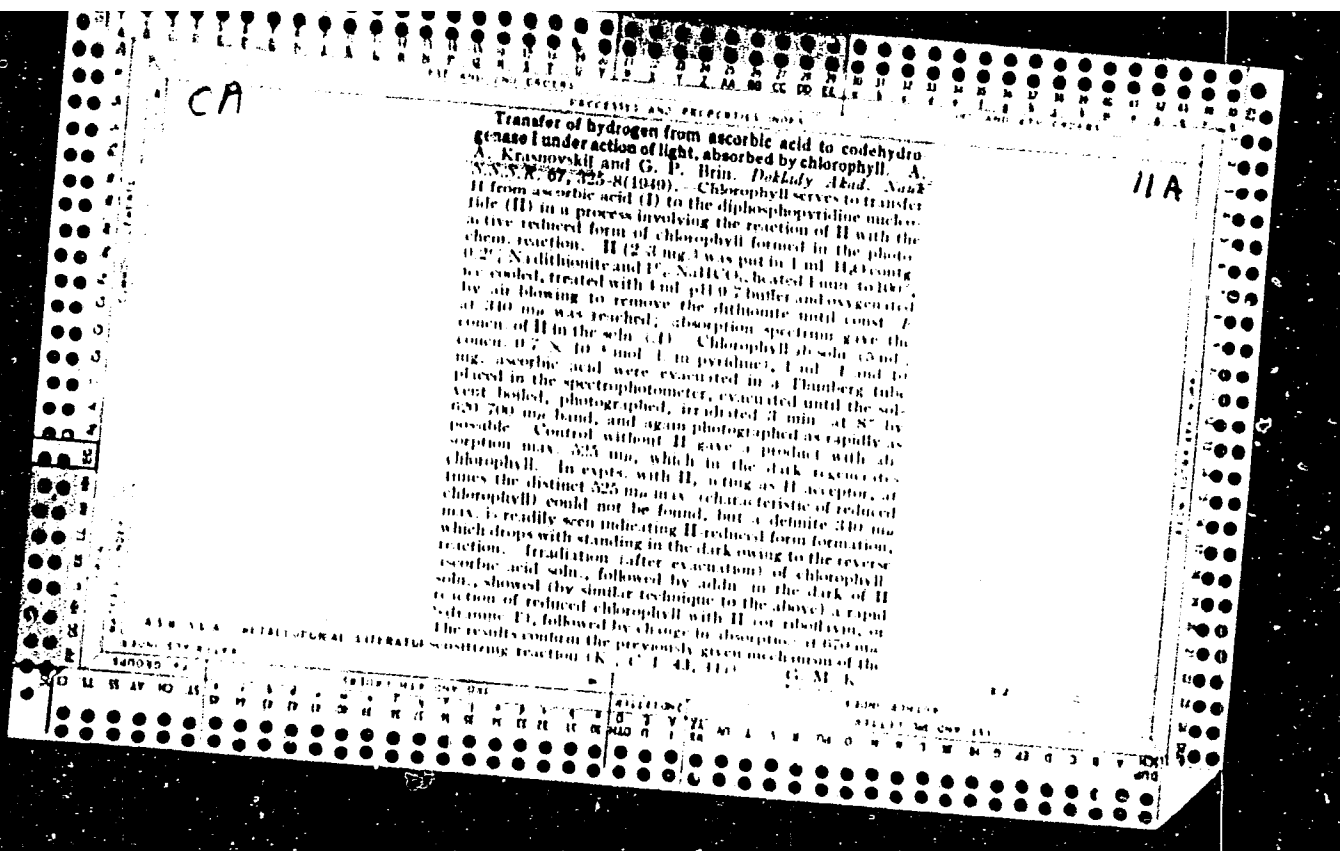
Jun 49

"Photochemical Properties of Protochlorophyll,"
A. A. Krasnovskiy, K. K. Voynovskaya, Inst Biochem
imeni A. N. Bakh, Acad Sci USSR, 4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 4

Studied characteristics of protochlorophyll separated
from cells to obtain data on its possible transforma-
tions under action of light. Characteristics studied:
absorption spectrum of protochlorophyll, in solution,
photochemical reduction of protochlorophyll, and
hydrogen transfer sensitized by protochlorophyll.
Submitted by Acad A. N. Terenin, 5 Apr 49.

46/49T11



68H KRASNOVSKIY, A.A.

All 27
Enzymes

Transfer of hydrogen from ascorbic acid to codehydrogenase I
by action of chlorophyll modified by bleaching. A. A. Krasnovsky
and G. P. Brin (*C.R. Acad. Sci. U.R.S.S.*, 1948, **67**, 435-438).
Illumination of chlorophyll in pyridine in presence of ascorbic acid
leads to production of reduced chlorophyll, which reacts in the dark
with a number of H acceptors, such as codehydrogenase I,
Safranine-T, riboflavin, and O_2 . Reduced codehydrogenase I is
able to donate its H to dehydroascorbic acid in absence of light.
R. TRUNCER.

CA

11D

Conditions for reversible transformations of chlorophyll under the influence of light. A. A. Krasnoyarskiy, G. P. Ilyin, and K. K. Volynskaya (A.N. Bakh Biochem Inst., Acad. Sci. U.S.S.R.), *Doklady Akad. Nauk S.S.S.R.*, 69, 384 (1969).—The reverse reaction of chlorophyll in the dark was observed only in org. solvents or in the presence of some bases, such as pyridine, histidine, or imidazole. Examn. of absorption spectra of such solns. reveals a shift of 662 mμ band in Et₂O to 660 in pyridine, while the 418 band shifts to 442 mμ, with the displacement of the entire spectrum. Photoreduction of chlorophyll a was observed only with ascorbic, dihydroxy-maleic acids, cysteine, PhNHNH₂, and H₂S, all giving reduced chlorophyll with an abs. max. of 525 mμ, which oxidizes in the dark to chlorophyll. In chlorophyll a the reversibility of photoreaction is high and the spectrum of regenerated product is that of the original, although in the presence of much ascorbic acid considerable amts. of irreversibly formed products are formed. In chlorophyll b the reversibility of photoreaction is low, the product has an abs. max. 445 mμ (in pyridine), and removal of pyridine from the product by H₂O washing and extr. with petr. ether gave the product with abs. max. at 643 and 432 mμ, which may be a product of irreversible reduction of the C-HO group of chlorophyll b. G. M. Kosolov

KRASNOVSKIY, A.A.

Photosynthesis in plants (biochemical aspects). Uspekhi Biol. Khim.
1, 473-506 '50. (MLRA 5:8)
(CA 47 no.14:7042 '53)

CA

11D

Reactions of the reduced form of chlorophyll. A. A. Krasnovskii and G. P. Ibrim (A. N. Bakh Institute of Arkt. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk*

S.S.S.R. 73, 1289-1291 (1950). Chlorophylls a and b, reduced by ascorbic acid in pyridine with irradiation (red filter) at 10° until a pink color formed, was treated with various reagents and the soln. directly examined spectro-photometrically (extinction at 670 mμ). The dark reaction of ascorbic acid itself in pyridine was similarly measured with phenolindophenol (oxidation-reduction potential 0.21 v. at pH 7), thionine (0.062 v.), and methylene blue (0.011 v.), all of which became decolorized if its curves are given). Nile blue (+0.12 v.), riboflavin (+0.22 v.), chloranil (-0.29 v.), and neutral red (+0.12 v.) were unaffected. Reactions with the reduced chlorophyll system with reagents having pos. oxidation-reduction potential showed regular oxidation of the former (curves given) by the above dyes, quinone, hematin, dehydroascorbic acid, Fe³⁺, NO⁺, NO₂⁺, and O₂. The reaction with dehydroascorbic acid is much slower than that with the dyes and the results above may be explained either by direct action of the dyes on reduced chlorophyll or by their intermediate action on dehydroascorbic acid, forming a reactive monodehydroascorbic acid, which then reacts with reduced chlorophyll. Reduced chlorophyll similarly reacts rapidly with the above dyes with neg. oxidation-reduction potentials that do not react with ascorbic acid in the dark; diphosphopyridine nucleotide also reacts, but vaniline does not. Hence the potential of the chlorophyll system is about -0.35 v. Malic acid also reacts, (CO₂H); retards reoxidation, while pyruvic, citric, succinic, fumaric, lactic, and acetic acids have no action. The temp. coeff. of reoxidation of reduced chlorophyll is small and indicates an activation energy of about 1.5-3.0 kcal. G. M. Kozolupov

CA

110

A study of the products of reduction of chlorophyll, its derivatives and analogs, by means of Timiryazev reaction. L. M. Kosobutskaya and A. A. Krasnovskij, *Doklady Akad. Nauk S.S.S.R.* 74, 103-6(1950); *"E. Nature* 32, 342(1986); 34, 62(1986); *Compt. rend.* 102, 680(1986). — Reduction of the pigments with Zn dust, AcOH-pyridine-H₂O system *in vacuo*, followed by reoxidation and spectrographic examn. of the products, showed that all chlorophyll-like substances studied (chlorophylls a and b, Zn-pheophytins a and b, and the Cu analogs) yield a product with abs. max. at 661 and 431 m μ , corresponding to spectrum of Zn pheophytin. Reduction product of Mg phthalocyanine is colored and does not absorb in visible region. The reduction products turn green on admission of air. All reduction products show reduced intensity of abs. maxima; with concd. chlorophyll soln. a max. at 510-30 m μ is found; the chem. nature of the products is unknown. Much pigment is destroyed irreversibly.
G. M. K.

CA

26

Relation between atmospheric stability of pigmented paint films and the pigment photosensitized formation of peroxide compounds. A. A. Krasnovskii and E. N. Gurevich. *Doklady Akad. Nauk S.S.S.R.* 74, 360-72 (1950).--In case of TiO_2 , peroxides were detd. by a colorimetric method based on measuring intensity of coloration from reaction of Fe^{+++} and CNS; accelerated atm. stability tests were made under a Care of 2000 w. In case of ZnO , measurements were made of the fading of methylene in an aq. suspension of ZnO instead of direct detn. of peroxide. TiO_2 with the structure of anatase was photochemically more active than rutile. Muffle ZnO had bright yellow fluorescence and ZnO obtained by calcination of carbonates had dark brown fluorescence. Usually, samples least active photochemically had least bright fluorescence. It is not clear, however, to what extent the dislocation of the crystal lattice of ZnO which detrs. its fluorescence also detrs. its photosensitizing activity. The formation of the peroxides leads to the accelerated destruction (photooxidation) of the binder around the particles of the pigment of the upper layer as a result of which "chalking" takes place. B. Z. Kamich

CA

3

Decolorization of methylene blue under the action of x-rays. Yu. L. Shekhtman, A. A. Krasnovskii, and I. V. Vtreshchinskii (A. N. Pash. Biochem. Inst. Acad. Sci. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 74, 767 (1950). - The decolorization of an aq. soln. of methylene blue, 20-170 micromoles in 0.1 N H_2SO_4 , was investigated as a function of the dose of x-rays, up to 10,000 rontgens. At the latter dose, the yields of the decolorization reaction were from 0.147 to 0.57 micromole/l. per 1000 rontgens, which corresponds to 0.004-0.21 moles. per ion pair. Plots of the fall of the absorption coeff. in 1000 mμ are nearly linear, and practically parallel for the different initial concns. Treatment of the reaction vessel with CrO_3 , followed by rinsing with H_2O , increases the decolorization at equal doses. Addn. of quinone, hydroquinone, glucose, or glycerol blocks the decolorization; this blocking effect first increases almost linearly with the log of the amt. added, then levels off. Exposure to x-rays results primarily in a decomposition of the solvent, giving rise to free radicals and ions which, in turn, react with the dissolved dye. The blocking effect of the org. substances is due to their interaction with the primary radicals and ions. N. Thon

CA

Photocatalytic action of some metal oxides. A. A. Krasnovskii and T. N. Gurevich. *Doklady Akad. Nauk S.S.S.R.* 78, 718-18(1980).—(1) The rate of oxidation by atm. O_2 of linseed oil and of linoleic acid in toluene or EtOH soln., heterogeneously catalyzed by metal oxides, i.e. the rate of absorption of O_2 (formation of peroxides by addn. to the double bond) is accelerated by simultaneous illumination with long-wave ultraviolet (400-410 mμ or shorter) absorbed by the solid oxide but not by the reactant and solvent. The promoting effect of the light is expressed by $\phi = h_1/(h_1 + h_2)$, where h_1 = zero-order rate of the dark catalyzed reaction, h_2 = of the photochem. reaction without catalyst, h_1 = of the catalyzed reaction on illumination. For linoleic acid in toluene (1 ml. of 10% soln.), at 40°, with 0.2 g. oxide, 3 ml. solvent, on TiO_2 (98% anatase structure) h_1 , h_2 , h_3 (in cu. mm. O_2 /min.), and ϕ , are = 0.39, 0.67, 4.3, and 4.0; on ZnO (from $ZnCO_3$) 1.77, 0.67, 1.87, 0.79; on Fe_2O_3 0.0, 0.67, 0.0, —; on Pb_2O_3 0.79, 0.67, 4.2, 2.8; on PbO 2.40, 0.67, 5.05, 1.8; on Cr_2O_3 0.20, 0.67, 0.22, 0.25. Rutile- TiO_2 shows a weaker effect than anatase. With TiO_2 , all reactions are somewhat slower in alc. with 5-6% H_2O than in toluene, but ϕ is about the same in the 2 solvents. Probably owing to complete dehydration, TiO_2 heated to 800° shows an increased catalytic activity; the photochem. activity of TiO_2 sample dried at 110° and heated to 800° is about the same. Adsorption of Cr^{3+} and Co^{3+} ions ($\sim 10^{-4}$ g./g.) increases the catalytic and lowers the photochem. activity

of TiO_2 . (2) The effects of illumination on the rate of the catalytic decompn. of H_2O_2 at 40° (3 ml. H_2O , 1 ml. H_2O_2 soln. of c %, amt. of catalyst a g.) are given by the following data (c, a, h_1 , h_2 , and ϕ): on ZnO , 1, 0.1, 17.5, 0.1, 20.0, and 1.14; on TiO_2 , 1, 0.1, 1.2, 0.1, 5.6, and 4.6; on Fe_2O_3 , 1, 0.1, 4.1, 0.1, 4.4, and 1.05 (practically no effect); on Cr_2O_3 , 1, 0.1, 0.4, 0.1, 0.4, and 0.8 (no effect); on Pb_2O_3 , (at 25°) 0.03, 0.01, 1.01, 0.03, 5.52, and 5.3; on PbO (at 25°) 0.03, 0.01, 3.25, 0.03, 9.75, and 3.0. Illumination of an Fe_2O_3 electrode gave no promoting effect on the decompn. of H_2O_2 . No effect of light was observed on the rate of the catalytic decompn. of Na_2O_2 in toluene. (2) The photocatalytic effect is pronounced with TiO_2 and Pb_2O_3 and PbO , to a lesser extent on ZnO . Of these oxides, only ZnO has a marked fluorescence at room temp.; ZnO and Pb_2O_3 are known to be photoconductors, but there are no data on the photocond. of TiO_2 . The lifting of an electron to the conduction zone through absorption of a quantum facilitates the electron transition between the adsorbed mol. and the surface and thus lowers the activation energy. The desensitization by adsorbed Cr^{3+} and Co^{3+} ions may be linked with the reverse process. The lowering of the potential barrier through illumination of the solid may, on the other hand, be linked with a transfer of vibrational energy to the adsorbed mol. through degradation of the quantum absorbed in the lattice. The chem. effect of the light-promoted catalysis amounts to formation of peroxide-type compds. on the surface which initiate chains in the vol. of the soln. The decompn. of H_2O_2 is no doubt initiated by free OH radicals formed on the surface upon absorption of a light quantum. N. Thon

BRIN, G.P.; KRASNOVSKIY, A.A.

Effect of compounds with various oxidation-reduction potentials on photosynthesis and respiration of Elodea. Biokhimiya '51, 16, 453-460. (MIRA 4:10) (BA -AIII My '53:728)

USSR/Biochemistry - Radiation Effects Nov/Dec 51

"Action of Ultraviolet Rays on Photochemical Activity of Chloroplast Substances," I. V. Vereshchinsky, A. A. Krasnovskiy, Inst Biochem Imeni A. N. Belk, Acad Sci USSR, Moscow

"Biokhim" Vol XVI, No 6, pp 621-626

Ultraviolet rays impair photochem activity of chloroplasts. This is not connected with reduction in quantity of extractible chlorophyll or with changes in the character of its binding to the chloroplast substance. It is suggested

202717

USSR/Biochemistry - Radiation Effects Nov/Dec 51
(Contd)

that the inactivation is primarily due to damaged labile links of the chloroplast enzyme system.

202717

KRASNOVSKIY, A. A.

*This individual will be
repeated on the next tree!*

KRASNOUSKIY, A. A.

Reel # 261
Krashenninnikova, N.G.
to
Krasnovskaya, TS. I

"APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826130

END

APPROVED FOR RELEASE: Monday, July 31, 2000

CIA-RDP86-00513R000826130C